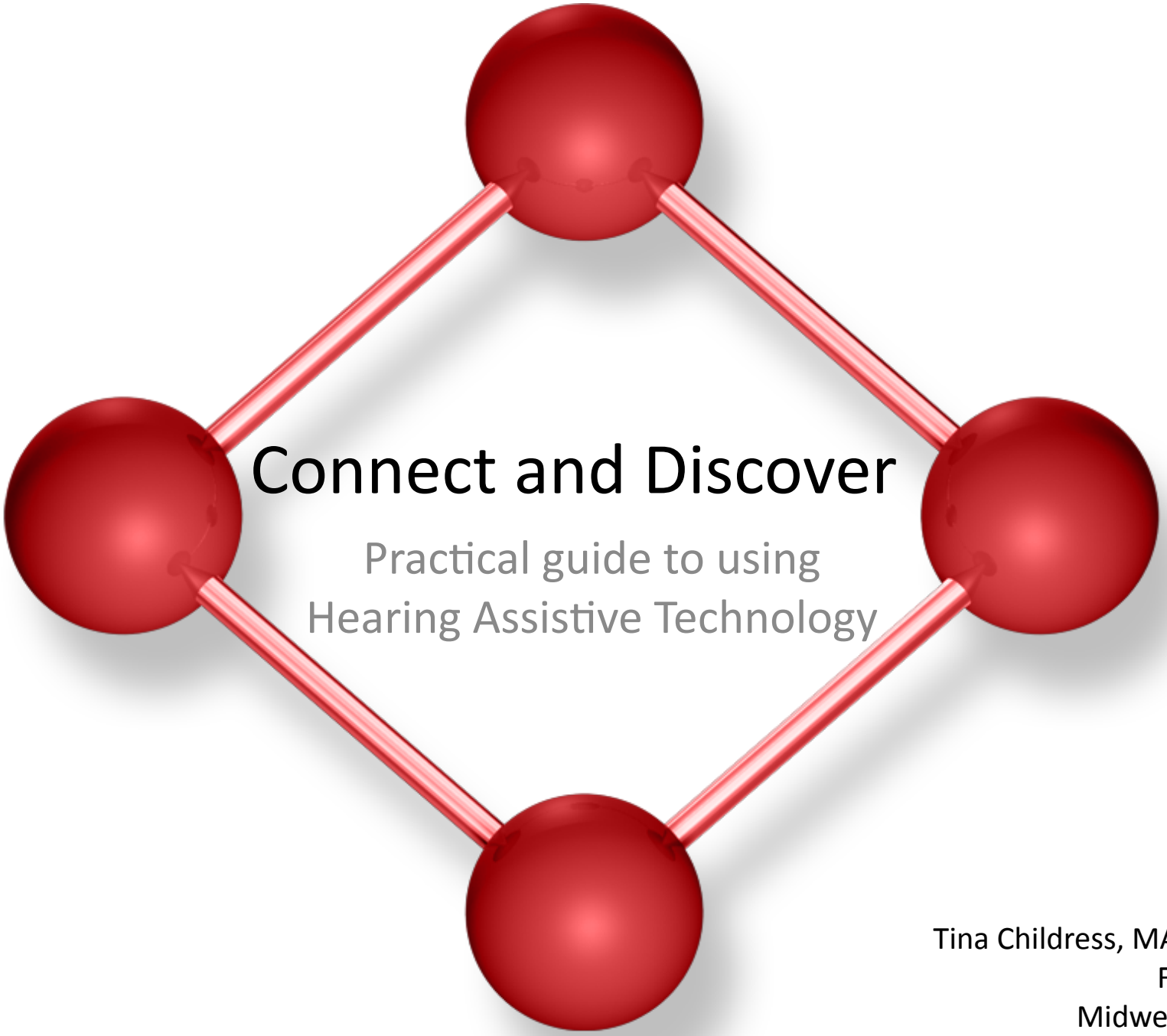


Connect and Discover

Practical guide to using Hearing Assistive Technology

Tina Childress, MA, CCC-A

Fall 2011

Midwest GURC

HAT

IR

CC

ALD

HA

T-coil

FM

OC

CI

To further complicate things…

- Hearing Assistive Technology (HAT)
  - Formerly known as Assistive Listening Devices (ALDs)
- Remote Microphone Technology
  - Formerly Frequency Modulation (FM) and/or Infrared (IR) systems

Why Assistive Technology?

- Reduces frustration
- Increases motivation
- Promotes independence
- Changes expectations
- Improves self-esteem/self-concept
- Increases opportunities

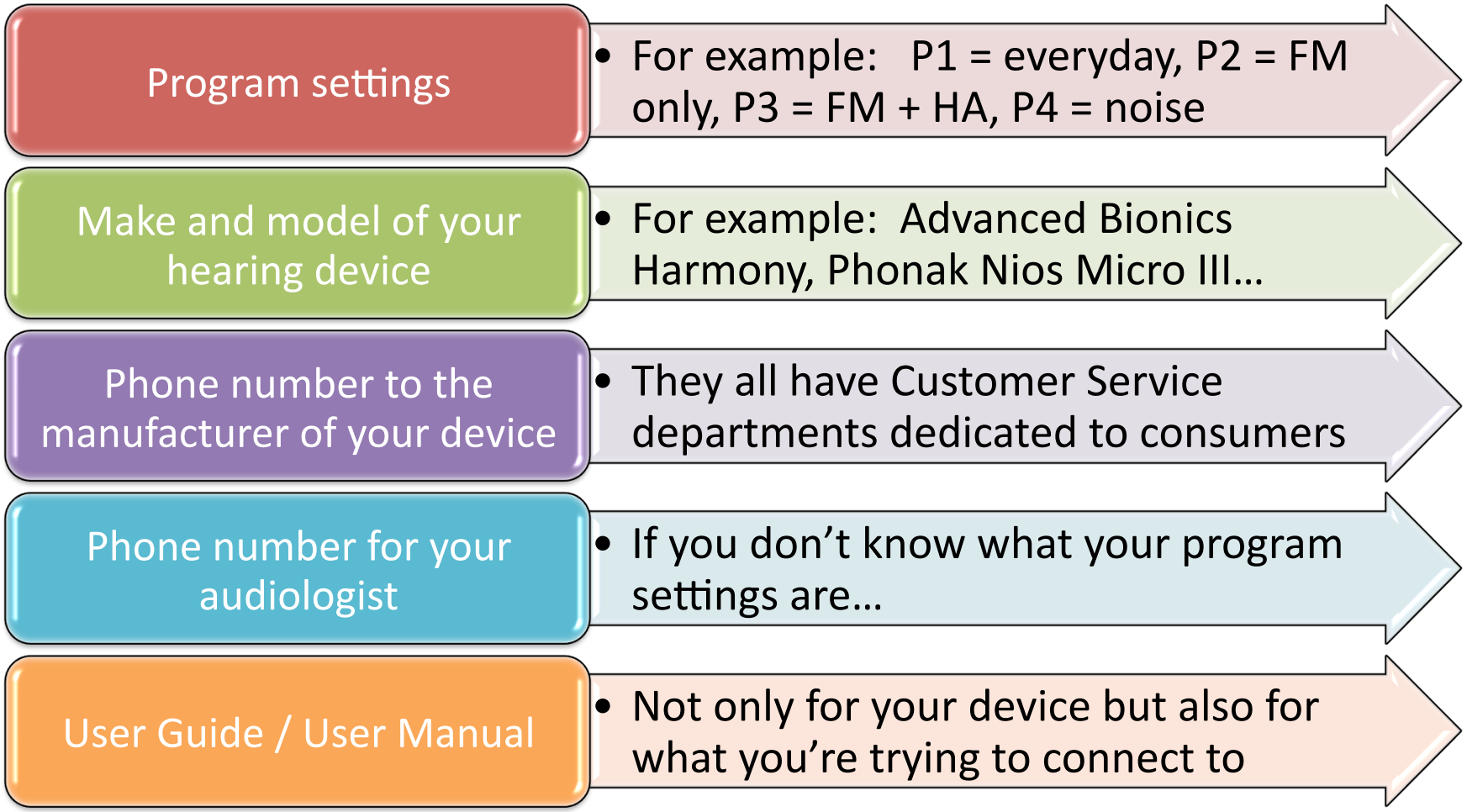
Examples of situations where AT might help you

- You are a completely visual communicator
- Your battery is dead
- Your HA or CI is being repaired
- You get limited benefit from your amplification and want to do better
- It's noisy
- …

Shopping for devices

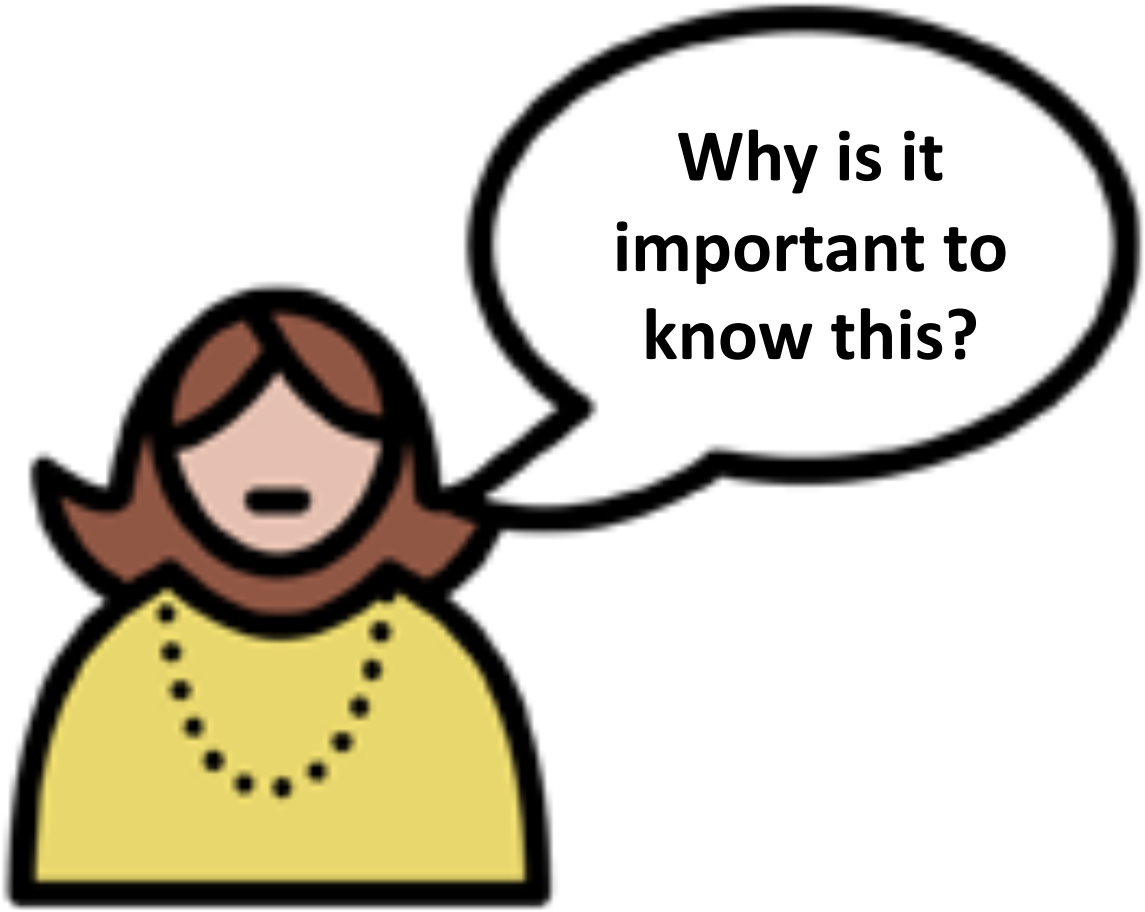
- Before you leave the store or purchase online, investigate the Return Policy
- Make sure you have the User Guide/User Manual with the device
- Try your device in places that you frequent (e.g., home, work, school, etc.) to make sure there is not interference

Information at your fingertips

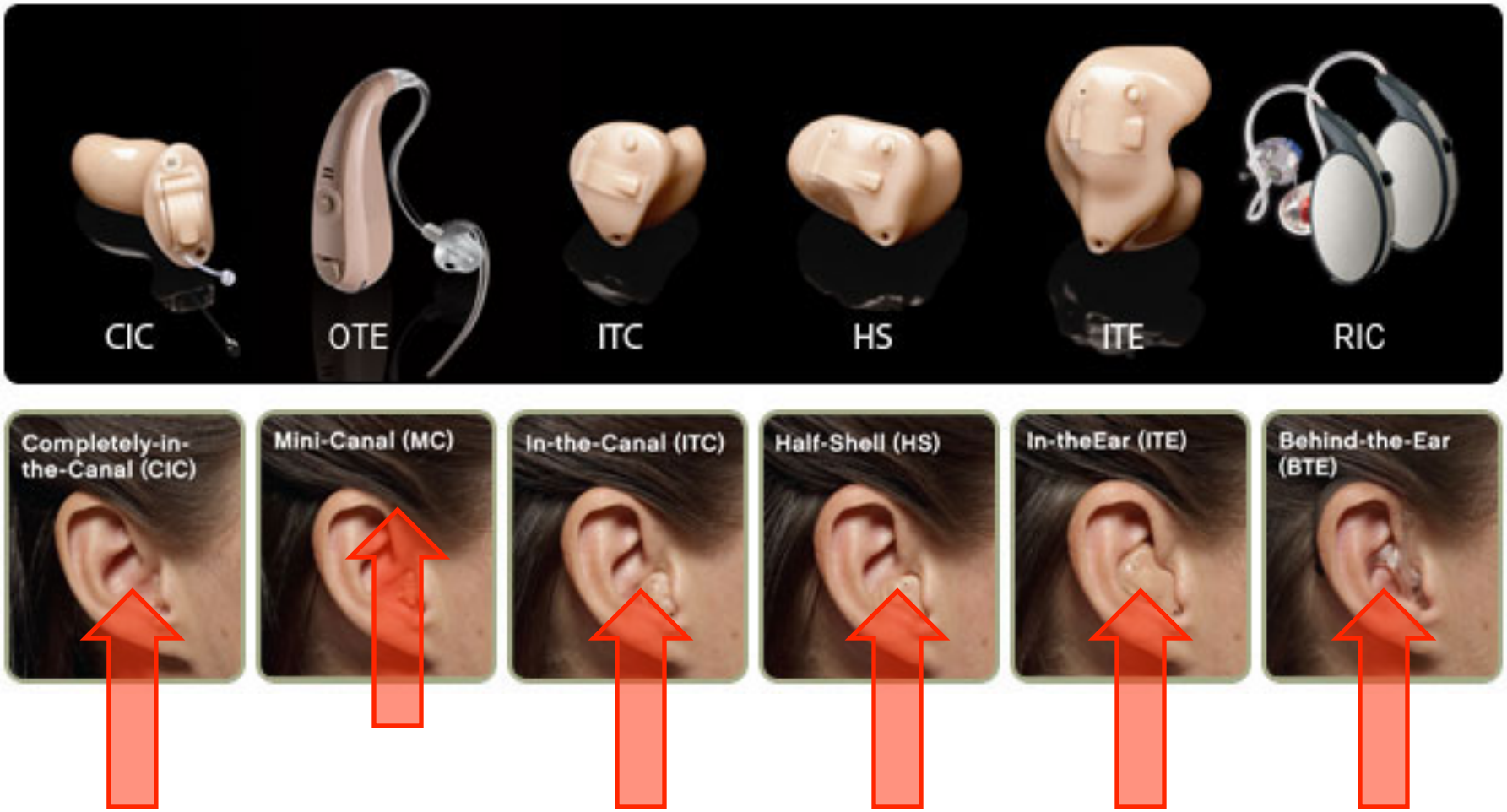

Program settings
• For example: P1 = everyday, P2 = FM only, P3 = FM + HA, P4 = noise
Make and model of your hearing device
• For example: Advanced Bionics Harmony, Phonak Nios Micro III…
Phone number to the manufacturer of your device
• They all have Customer Service departments dedicated to consumers
Phone number for your audiologist
• If you don't know what your program settings are…
User Guide / User Manual
• Not only for your device but also for what you're trying to connect to

TERMINOLOGY

Microphone location



Hearing aids



www.activears.com/images/productTypes3.jpg

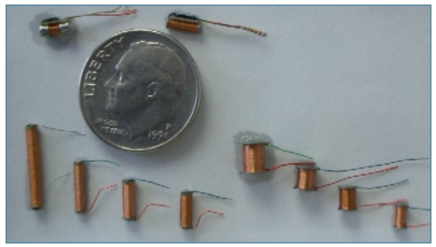
Cochlear implants

Ear level processors

Body worn processors

What is a T-coil?

- T-coil (telecoil) is small coil of wire built into HAs or CIs and is designed to pick up magnetic signal from assistive listening systems and HA compatible telephones
- T-coil = Telecoil = T-switch = Telephone Switch



Mixing ratio

- This is the relationship between your auxiliary input (either via plugging into your CI/HA or via T-coil) compared to your environmental microphone
- Be sure to check with your audiologist if you do not know what your mixing ratio is

Mixing Ratio

Auxiliary only

- All of the signal comes through the audio cable or T-coil
- You will not be able to hear things around you or your own voice

Auxiliary + Environmental microphone

- You will be able to hear the signal through your audio cable or T-coil
- You will be able to hear what is going on around you

What is Bluetooth?

- It's a wireless and digital technology that allows certain compatible devices to communicate with each other wirelessly
  - You need to "pair" the devices before it will work
  - Most of the time, the code is either "0000" or "1234" but be sure to check the manual

CONNECTING

Ways to connect to HAT

INDIRECT

- Use your environmental microphone on your HA or CI

DIRECT

- Use a patch/axuiliary/audio cable and adapter to plug directly into your HA, CI or via your FM system

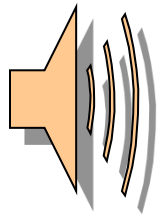
T-COIL

- Accessed through specific program setting on your HA or CI

What can I connect to?

Telephone Cellphone Videophone	
Media (CD, MP3, iPod, DVD, computer, portable gaming systems, TV)	

INDIRECT



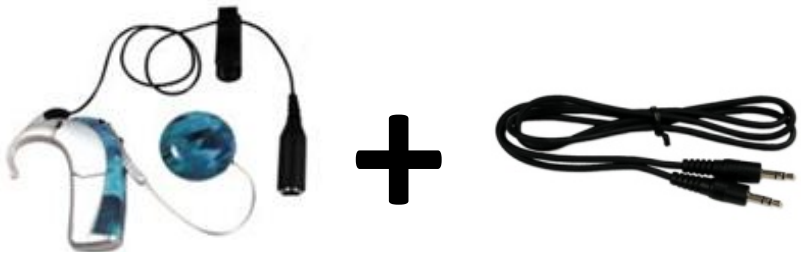
- Increase the clarity and/or loudness of the signal by improving the acoustics
- The environmental microphone receives the sound
- When using hearing aids with the phone, may need a cushion to reduce feedback (i.e., that squealing sound)

INDIRECT

DIRECT

- Any wired connection between the CI , HA or FM and another device
- Possible settings
  - Auxiliary signal only
    - Will not be able to hear any environmental sounds (including your own voice)
  - Auxiliary signal + environmental microphone
    - Can hear environmental sounds around you

DIRECT



DIRECT
Cochlear implant recipients

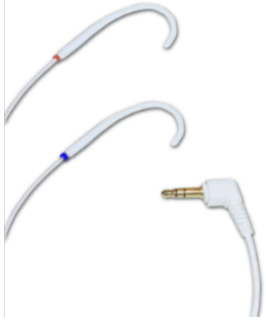
- Be sure to directly connect to BATTERY POWERED devices only if using a standard auxiliary cable

- If connecting to something that plugs into the wall (e.g., television or computer), be sure to use the recommended cable with surge protection

T-COIL

Wired neckloop

Wired induction earhook(s)



Bluetooth neckloop

Bluetooth induction earhook(s)

Check with your audiologist if you are not sure you have this setting on your HA or CI

ASSISTIVE LISTENING DEVICES

Assistive Listening Devices

- How can ALDs help? They can:
  - Bring the sound louder to you
  - Improve the clarity
  - Lessen the effect of background noise
- Parts:
  - Transmitter (microphone)
  - Receiver
- Having a T-coil on your hearing aid and/or cochlear implant gives you more options

Types of Assistive Listening Devices

Frequency Modulation (FM)

Infrared (IR)

Induction Loop

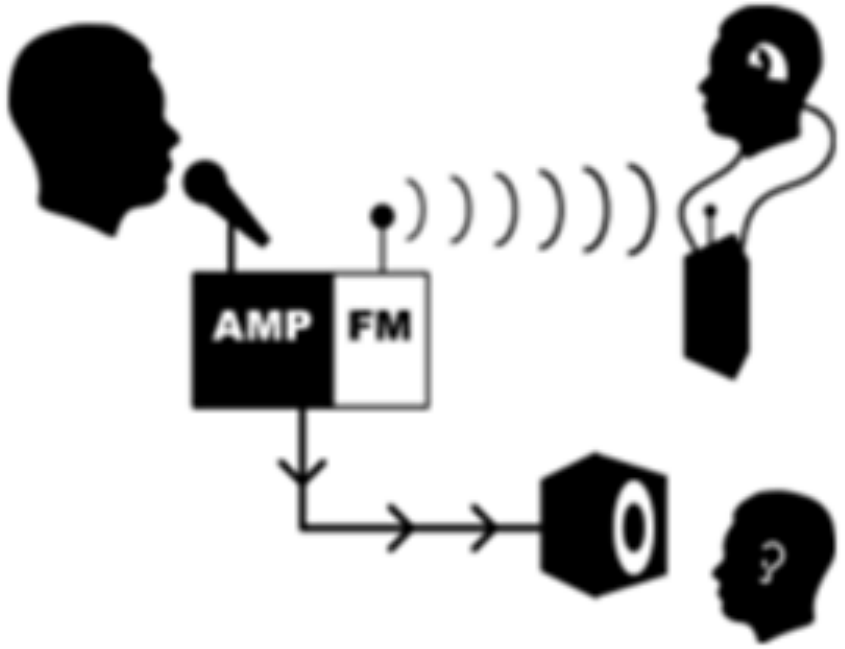
Personal ALD

Note for cochlear implant users

- See if your patch cable and/or external microphone might help you instead…less expensive!
- Check with your audiologist about which cable should be used (e.g., battery powered vs. wall powered)

FM system

- Signal is transmitted via FM (radio signal) waves to a receiver used by the listener
- Applications
  - Classrooms
  - Theaters
  - Meeting spaces
  - Places of worship
  - Car
  - Restaurants



Transmitters

Microphone styles

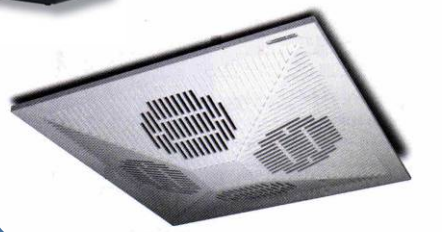
Receivers

Hearing Aid

Cochlear Implant

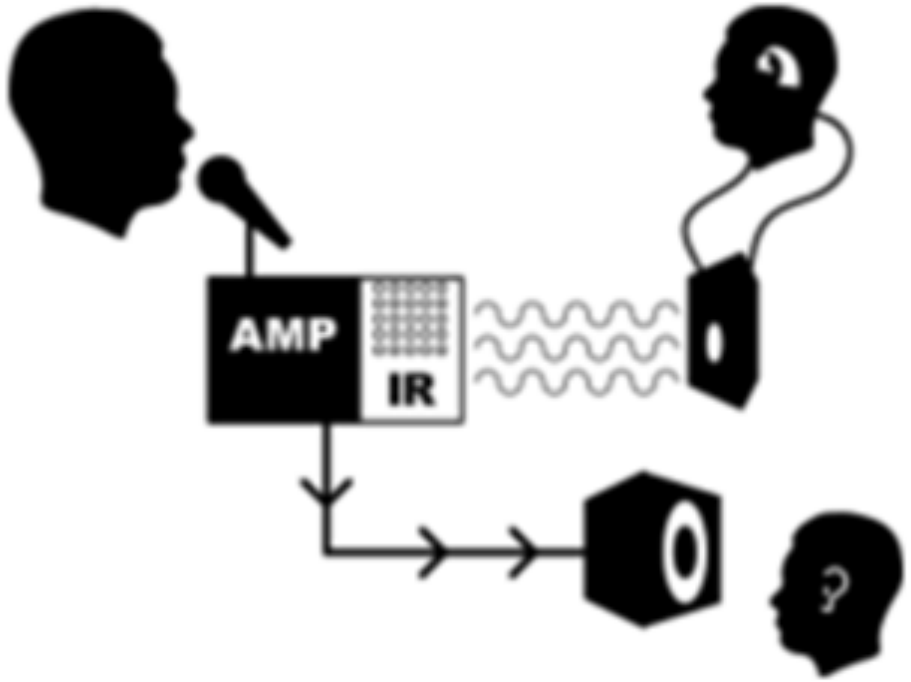
Soundfield

Toteable	Classroom



Infrared Devices

- Signal is transmitted via infrared (light) waves to a receiver used by the listener
- Applications
  - Theaters
  - Classrooms
  - Meeting spaces

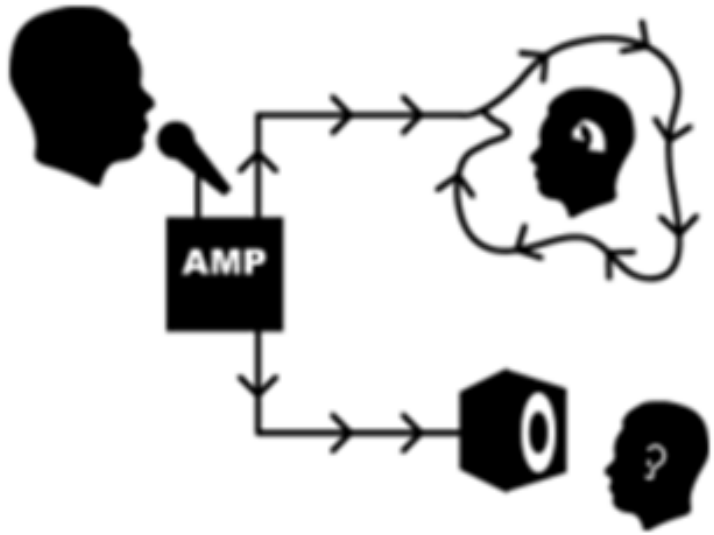


Infrared Devices

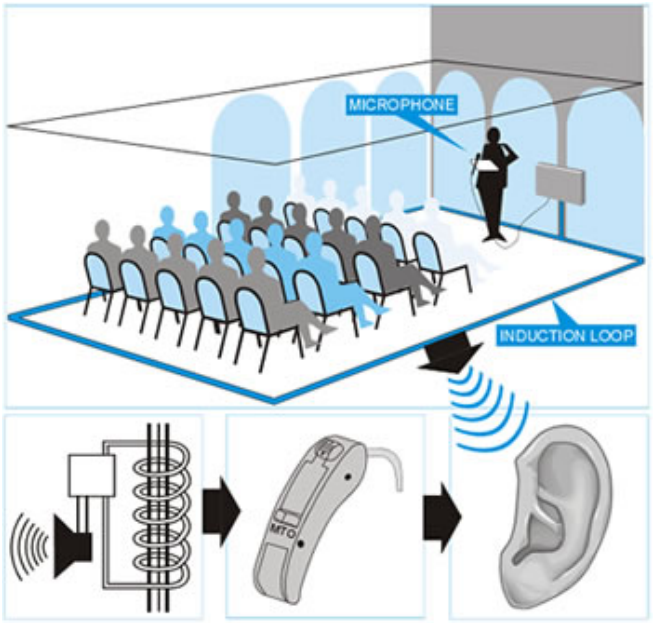
Receivers	Transmitter

Induction Loop Systems

- Physical wire is laid down around the area to be amplified
- Signal is transmitted via the electromagnetic field and received via the T-coil in your HA or CI
- Applications
  - Large areas (e.g., churches, meeting rooms, airports)
  - Transient areas (e.g., drive thrus, ticket windows)
  - Individual areas (e.g., home, office, car)
  - Classroom (not as common now)

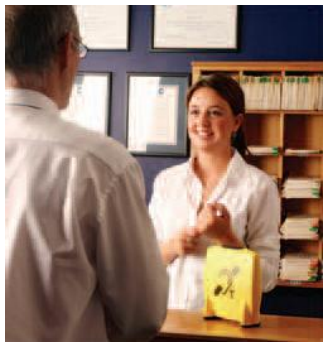


Induction Loop Systems



Set up for room loop

Taxi



Personal loop

Chair loop

Personal ALDs

- Microphone and receiver are housed in one unit (box)
- Applications
  - Noisy situations (e.g., restaurants)
  - Meetings

Headphones

T-coil

CELL PHONES

Cell phones

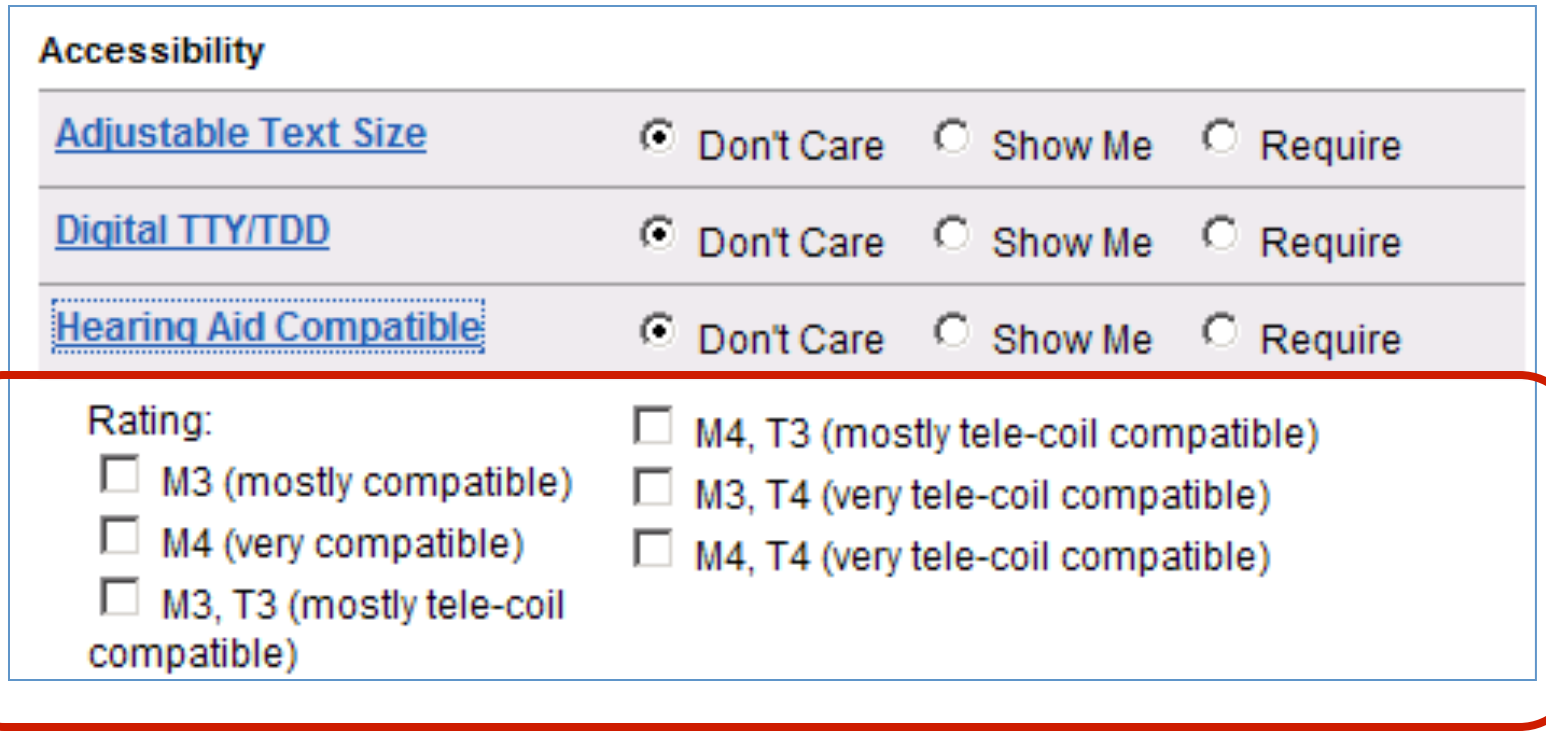
- The FCC requires all cell phone makers and service providers to make a certain percentage of phones hearing aid compatible (HAC) for people using hearing aids and cochlear implants

- Devices that are HAC compliant have:
  - Less static
  - Less interference
  - Better telecoil connections

- HAC compliant device packages are marked w[illegible] “T” ratings

www.phonescoop.com/phones/finder.php

- Click on “Show all options”



What are “M” and “T” ratings?

“M” rating

- “M” rating refers to the microphone mode.
- Wireless devices rated M3 or M4 are likely to generate less interference

“T” rating

- “T” rating refers to the telecoil mode
- Wireless devices rated T3 or T4 are likely to be more usable with a hearing device's telecoil

Look for M4/T4 to have the best chance of being interference free whether used with your hearing aids or cochlear implants in microphone or t-coil mode.

Desired Cell Phone Features for individuals who are D/HH

- Hearing Aid Compatible
- Audio Jack for headsets/ neckloops
- Volume control
- Display and keypad lighting control
- Vibrating alerts or vibrating accessory
- Adjustable fonts
- Flashing screen
- Different ringer volume and tones
- Bluetooth
- Text messaging
- Speaker phone
- Teletypewriter (TTY)
- Speech-to-text
- Video streaming

Phones

Indirect

Hold phone over environmental microphone or use speakerphone

Use Bluetooth headset over environmental microphone

Use boom microphone headset over environmental microphone

Use Bluetooth speaker

Phones

Direct

Custom made cellphone patch cable

- Contains a microphone

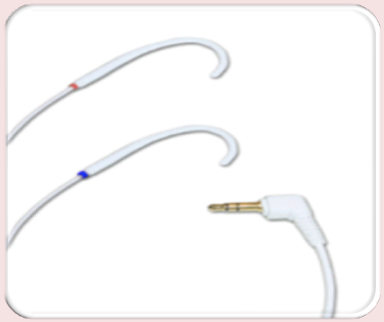
MicroLink system

- Use SmartLink transmitter which has Bluetooth function

Phones

T-coil

Amplified neckloop



Induction earhooks

Bluetooth neckloop

Bluetooth induction earhooks

Media Players

Indirect

- Regular or Bluetooth headphones
- Good speaker system

Direct

- Use audio/auxiliary cables
- Mono (1-ring) / stereo (2-ring)
- Most media players are 3.5 mm (1/8th inch)

T-coil

- Amplified or Bluetooth neckloop (mono signals to both ears)
- MusicLinks (induction earhooks with separate channels for true stereo)

Television

Indirect

- Infrared system with headphones
- Good quality speakers

Direct

- TV HiFi cable
- Plug FM transmitter into TV output jack

T-coil

- Whole house loop
- Chair loop

Bilateral (HA+HA / CI+CI) and Bimodal (HA+CI) Applications

Indirect

- Headphones
- Speakers

Direct

- Y-connector

T-coil

- Neckloop
- Induction earhooks

Cochlear Implants

- Advanced Bionics
  - www.advancedbionics.com
- Cochlear Corporation
  - www.cochlearamericas.com
- Med-El
  - www.medel.com

Hearing Aids

- Comprehensive list and links to various hearing aid manufacturers
  - http://deafness.about.com/od/hearingaids/tp/Hearing-Aid-Manufacturers.htm
  - http://www.hearingplanet.com/hearing-aid-guide-nyt.php

Hearing Assistive Technology*

- Phonak FM
  - http://www.phonak.com/us/b2c/en/products/fm.html
- Oticon FM
  - http://www.amigofm.com/
- Front Row
  - http://gofrontrow.com/
- LightSpeed
  - http://www.lightspeed-tek.com/

* This is not a comprehensive list

Vendors*

- TecEar
  - www.tecear.com
- Harris Communications
  - www.harriscomm.com
- Hal-Hen
  - www.hal-hen.com
- ADCO Hearing
  - www.adcohearing.com
- Soundbytes
  - www.soundbytes.com
- ClearSounds
  - www.clearsounds.com

* This is not a comprehensive list

ALERT SIGNALING DEVICES

Alert Signaling Devices

- Devices that alert the individual to the presence of sound by
  - Vibration
  - Light (lamp or strobe light)
  - LOUD audible alarm
    - low pitch or high pitch

Alarm clocks

- Stationary

- Portable

Visual alerting systems

- Fire/smoke
- Carbon monoxide
- Weather radio
- Baby monitor
- Door knocker

Being alert on the road

- ADA Hotel Kit

Use it or Lose it!

Public Venue ALD Access

- Check in advance
- Look for symbol
- Seek appropriate personnel
- Bring CI connections
- Get to know available equipment at the venues you like to frequent
- Trial and patience

Large, but Quiet Gatherings

- Indirect (T-mic or processor mic)
  - Headphones with FM or Infrared receiver
  - Whole room speaker (look for the “sweet spot” and/or preferential seating)
- Direct Connect
  - Lapel microphone
  - Personal ALD
  - Personal FM
    - Caveat: echo effect
- T-coil
  - Looped Room
  - Infrared Receiver

Infrared ALDs

- Invisible light rays
- Indoor use only
- Common in theaters, auditoriums, play houses, music halls
- Can purchase own receiver to take in
- Can use their neckloop receiver with your T-coil
- Connecting to CI can be an issue